

to the outbreak of the epidemic. Further to lessen the danger, every separate household is to be requested immediately to carry out scrupulously the precautions and orders in reference to disinfection which are to be issued by the Government.

THE EARTH AS A GLOBE

Die Erde als Weltkörper, ihre Atmosphäre und Hydrosphäre, Astronomische Geographie, Meteorologie und Oceanographie. Von Dr. Julius Hann. Pp. 209. (Prag: F. Tempsky; Berlin: G. Freytag. 1884.)

IT sometimes happens that the leading words in the title of a book give a very inadequate impression of its contents. Such, to an English reader at least, might be the case as regards the work before us. We should have rather anticipated a discussion of the relation of our globe to the surrounding universe, or at any rate its position as a member of the great family dependent on the same central source of light and warmth. A compatriot of the writer, it is but fair to suppose, would have formed a juster anticipation of what the title-page expresses and the contents explain, that we have here a description of the earth as an isolated globe. The first section sets before us its form, dimensions, density, seasons, magnetism in its several aspects, and auroral illumination. The following one discusses the various conditions of our atmosphere with regard to temperature, pressure, humidity, rainfall, winds, cyclones, and all that English people express by the brief and usually not complimentary phrase, "the weather." The third section relates to the "hydrosphere," or fluid envelope, comprising its extent, colour, saltiness, temperature, currents, waves, and tides. This programme is carried out not only with a great deal of industry, and care, and judgment, but with a clearness and facility of expression which are not always remarkable in scientific treatises. We are very favourably impressed by it as a whole, and look upon it as a very valuable addition to the branch of science which it undertakes to elucidate. At the same time there are a few respects in which improvement might be desirable. We should have preferred, for instance, some explanation of the comparative imperfection of the longitude-measures obtained from Jupiter's satellites, as well as from lunar distances; the aeronautic details might have borne expansion with advantage; and we are a little disappointed in the very scanty notice of atmospheric electricity. Of this it may indeed be said that its investigation is peculiarly difficult, and that many of its modifications hitherto defy explanation; but it would have been, we venture to think, a preferable course, especially as so much pains have been taken with magnetism, if more explicit reference had been made to an influence of so powerful, yet so occult and mysterious a nature.

We may add, though we are treading on uncertain ground, that our author's descriptions of the English climate, or rather of what he considers that it ought to be, with regard to dryness or the reverse, are not altogether in agreement with our own experience. The character of our month of February, as expressed in the very ancient and still surviving epithet, "fill-dyke" (or "fill-ditch"), or in an old rhyme of the seventeenth century—

"Foul weather is no news; hail, rain, and snow
Are now expected and esteem'd no woe,"—

does not tally well with our author's estimate of January as the most rainy of months, at least in West England; and his description of October as having a full maximum of rain in East and a secondary maximum in West England matches as little with the traditional remark of half a century ago, that eighteen fine days always occur in that month. Nor again is the April of West England, as he asserts, characterised by dryness, which used to be predicated of March, together with, in our grandsires' remembrance, a degree of heat which caused the unyoking of the weary ox during the noontide hours; so that we find in these instances the anticipation or postponement of a month. Our ground however is, as we have said, somewhat insecure; and we are obliged to admit that our old-world remembrances are often as far out of keeping with our present experience as the theoretical deductions of Dr. Hann. The October of late years has certainly not maintained its reputation for fineness, and we miss the regularity as well as the intensity of the equinoctial gales. There is an element of uncertainty and instability not only in the daily or monthly condition of the weather but in its annual recurrence, at least as far as our own climate is concerned; and it has presumably a much wider extent: a similar remark is not unknown in Switzerland, and was confirmed as to North Italy by the disappointing experience of that most accurate astronomer, Baron Dembowsky, who in his latter years had, as he informed the writer of these lines, to contend with an unwonted amount of unfavourable skies. Such variations may possibly be very slowly periodical, and, if so, their recurrence might well be the subject of a careful examination. The weather-lore of modern days is undoubtedly far in advance of the imperfect forecasts of a century ago, and the pages before us have done well in aid of its further progress; but experience shows that the science of meteorology requires to be set upon a deeper and stronger foundation. The neglect of one or more imperfectly appreciated factors is probably indicated by the uncertainty or inconsistency of the results. One such factor may readily be pointed out in electrical agency, latent on every side, but awakened from time to time in manifestations equally fearful and incomprehensible. How to take due account of this all-pervading influence is a problem for future generations.

In closing our brief notice of this valuable work we would especially allude to the especial clearness—with few exceptions—of the very satisfactory as well as numerous diagrams which illustrate it. So far as we have observed, the faults of the book are very few: the greatest, as far as English students are concerned, is one that may easily be rectified, and we trust soon will be—its appearance in a foreign tongue.

PRACTICAL BOTANY

Das botanische Practicum. Von Dr. Eduard Strasburger. (Jena: Gustav Fischer, 1884.)

THE production of a series of important works in rapid succession has pointed out Prof. Strasburger as one of the most prominent figures among botanists of the present century. It will be readily

seen from the character of his researches, which deal for the most part with questions of minute structure and development, that he combines unusual power of close observation with originality of treatment and wide knowledge of methods. These qualities, together with a clear style of exposition, are those most needful for the production of a handbook for the guidance of students in the botanical laboratory; and the result does not disappoint the expectations of those who have been awaiting the appearance of Prof. Strasburger's volume.

The 600 pages of which the book consists are printed partly in large, partly in small, type, the former being intended for the beginner, the latter for the use of more advanced students. The whole is divided into thirty-four lessons, corresponding to the number of practical demonstrations habitually given in the course of one semester in a German University. But, as the author freely admits in his preface, it is not assumed that a detailed study of the objects named in one lesson could be made in the time during which one demonstration lasts; it is, however, stated that the time would usually suffice to give the student a general idea of the most important points. With due deference to Prof. Strasburger, in this admission lies the weak point in the book; if such a system as this be adopted with students on their first entrance into the botanical laboratory, and if the work be so presented to them that it should appear to them desirable rather to hurry through the study of a number of objects than to pay closer attention to a few, the result would naturally be the encouragement of a superficial style of observation; this method is not at all consistent with that usually adopted by German professors, and our experience as teachers on this side of the Channel does not lead us to approve of it. If, however, the student be not limited in respect of time, he would by carefully and successfully working through the course, both of large and small type, laid down for him, find himself at the end of it an accomplished laboratory botanist, well fitted to strike out a line of research for himself.

After giving a short introductory description of the microscope itself, and a list of makers and prices, Prof. Strasburger leads the student on by gradual steps, from the observation of starch-grains and their reactions, to the more complete study of the cell, with its included bodies, special attention being paid to the plastids and their various modifications. Having thus become acquainted with the general morphology of the cell, he is introduced to the study of tissues, the epidermis with its appendages being taken first, and subsequently the vascular bundles and surrounding tissues, as seen successively in the axis, root, and leaf; the constituent elements of these several tissues in the mature condition are made the subject of detailed observation. It is to be remarked, however, that little attention is paid to the comparative study of the *course* of the vascular bundles in the shoot, and the methods of its investigation; it is true that on pp. 282-303 this subject is dealt with in small type, but even there the treatment is almost entirely confined to the modifications of arrangement at the point of transition from stem to root; thus the student who works through the large type only will gain a very complete knowledge of the details of structure of the vascular bundle in various types of plants, while his knowledge of the arrangement

of the whole bundle-systems in those plants may be very limited.

This course of study of the tissues of the vascular plants in the mature condition having occupied eighteen chapters, the 19th and 20th are devoted to a comparative investigation of the structure of growing points of stems and roots, and the development of tissues, while later chapters deal successively with the structure of the vegetative organs of the Mosses and of various forms among the Thallophytes. In Chapters XXIV.-XXXII. Prof. Strasburger treads upon ground which is peculiarly his own, and brings before the student in succession various examples illustrating the reproductive processes in plants, starting from the lower forms, and proceeding to those of higher organisation. In the concluding chapter he illustrates the processes of nuclear- and cell-division by means of examples already familiar to those who have followed his brilliant researches in this quarter.

The whole book thus forms a compendious and, including the small type, a very complete course of instruction for the student in the botanical laboratory. Throughout the text ample information is given as to methods of treatment, and the use of reagents; and this information is drawn together and made accessible by means of a special index (No. III.). Of the other indices, which form a most valuable addition to the work, the first refers to the names of the plants investigated, and the second to the instruments used, while, finally, No. IV. is a general index to names, reagents, and apparatus.

Prof. Strasburger has treated the question as to the advisability of placing drawings of the objects under investigation before the student in the laboratory in a truly characteristic manner. He has illustrated his book by 182 woodcuts, all of which have been specially prepared for this work. Whatever may be our views as to the effect of the use of such figures on the student, these, being drawn in Prof. Strasburger's well-known style, constitute in themselves a most welcome addition to the figures hitherto published.

There can be no doubt that among senior students and teachers this book will be appreciated as its great merits deserve; and that it will henceforward be an indispensable item in the furniture of the botanical laboratory. But, as may be gathered from what has been said above, it is no book for the cramming student; time must be allowed, and even more time than its author seems to realise, if full advantage is to be reaped from the course laid down. For this reason it is to be feared that it will not be so popular among our junior students as with those who are in a position to judge better of its value. F. O. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Chalk and the "Origin and Distribution of Deep-Sea Deposits"

In a letter of Mr. Starkie Gardner's in the last number of NATURE (p. 192), he stated that my opinion as to the Chalk